Adama Science and Technology University (ASTU)

PEOs and SOs of ASTU's Programs

Office of Academic Program Directorate

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Adama, Ethiopia

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Program Educational Objectives (PEOs) and Student Outcomes (SOs) of ASTU

June, 2024
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Vision, Missions, PEOs and SOs of Academic Programs

Vision

- ASTU aspires to be the first choice in Ethiopia and the premier center of excellence in applied science and technology in Africa by 2030.

Missions

M1: Produce ethical and internationally competent graduates in applied science and technology through quality education.
M2: Conduct problem solving research.
M3: Provide demand driven community service.
M4: Serve as center for innovative knowledge and technology transfer for various industries.

Academic Programs

Adama Science and Technology University, ASTU, is one of the two science and technology universities established to contribute to the industrial development of Ethiopia by providing high-quality education and training in scientific and technological disciplines. The university's focus on research-oriented science and technology education is a key part of its strategy to produce qualified and competent professionals for the nation's industrial and economic progress. ASTU has put in place seventeen undergraduate country's need based academic programs based on the Korean Science and Technology University experiences. These programs were developed with well-defined objectives and outcomes, have a distinct character of flexibility, being futuristic, integrally linked to research and CoEs, strong in design component and being connected to local challenges.

ASTU is actively working to internationally accredit all of its academic programs through the Accreditation Board for Engineering and Technology (ABET). The pursuit of ABET accreditation across all of ASTU's academic programs underscores the university's dedication to producing graduates who are prepared to meet the growing demands of the global job market and contribute to the industrial development of Ethiopia. Two of the eight ABET criteria are program educational objectives (PEOs) and student outcomes (SOs).

Program Educational Objectives (PEOs)

PEOs are broad statements that describe what graduates are expected to attain within 3-5 years after graduation. It emphasizes expertise, engagement, learning, leadership and teamwork.

Student Outcomes (SOs)

SOs describes what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program. The detail list of the Program Educational Objectives (PEOs) and Student Outcomes (SOs) for each program at Adama Science and Technology University are presented in the next subsection.

1. Applied Biology Program

1.1. PEOs of Applied Biology Program

PEO-1: To produce biologists that able to apply biological concepts at cellular and molecular levels with skills, and professional ethics who can lead the industrial sectors, interpret biological data, and present scientific reports

PEO-2: To produce biologist who can design and apply the principles of applied biology to identify and solve societal problems related to industry, agriculture, health, environment issues, teaches educational institutions and search solutions in teams and in collaboration with the community, governmental bodies and NGOs

PEO-3: To produce Biologists who can conduct biological and biotechnological process within research sectors with emphasis on genetic engineering for production enhancement, pharmaceutical biotechnology for drug and / or natural production, Biofuel, biogas and biodiesel engineering for energy production, etc.

PEO-4: To produce Biologists committed to bring sustainable development in terms of resource and energy conservation and sustainable utilization, and biological productions at small scale and commercial levels for the betterment of society and nation.opportunity at national and international levels

PEO-5: To add new field of study or courses based on national interest and generate trained man power on designed specific packages to create job opportunity at national and international levels

PEO-6: To produce biologists who demonstrate technical competency and leadership to create, start-up business of their own and become professional bio-engineers leading to a successful career

1.2. Student Outcomes

SO-1: An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of biology and related science and/or technical topics to areas relevant to applied biology.

SO-2: An ability to formulate or design a system, process, procedure or program to meet desired needs in applied biology.

SO-3: An ability to develop and conduct biological experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.

SO-4: Ability to study postgraduate study at national and international levels.

SO-5: Ability to effectively communicate biological findings with a range of audiences.

SO-6: Ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.

SO-7: Ability to function effectively in teams of biologists and others that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty related to biological sciences.

SO-8: Ability to design projects based on social demand, training them and/or practical display on how to engage in working habit for their income generations.

2. Applied Chemistry Program

2.1. Program Educational Objectives (PEOs)

PEO-1: To produce qualified chemists with operational and leading role in chemical industries/ institutes.

PEO-2: To produce graduates capable of integrating and relating chemistry knowledge to address environmental and societal issues.

PEO-3: To produce competent and qualified chemist who can carry out demand driven and collaborative research to address socio economic problems.

PEO-4: Enabling graduates to pursue higher studies and to become entrepreneurs

2.2. Student Outcomes (SOs)

SO-1: Identify, formulate, and solve broadly defined technical or scientific problems of applied chemistry by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline

SO-2: Formulate or design a system, process, procedure or chemistry related program to meet desired needs

SO-3: An ability to develop and conduct chemistry related experiments, analyze by applying appropriate techniques, modern instruments and interpret data and use scientific Justification to draw conclusions

SO-4: An ability to communicate effectively with a range of audiences

SO-5: Understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts

SO-6: Function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

SO-7: Ability to demonstrate the capacity to undertake lifelong learning

3. Industrial Chemistry Program

3.1. Program Educational Objectives (PEOs)

PEO-1: To produce qualified Industrial chemists with operational and leading role in chemical industries/institutes.

PEO-2: To produce graduates capable of integrating and relating Industrial chemistry knowledge to address environmental and societal issues.

PEO-3: To produce competent and qualified Industrial chemist who can carry out demand driven and collaborative research to address socio-economic problems.

PEO-4: Enabling graduates to pursue higher studies and to become entrepreneurs

3.2. Student Outcomes

SO-1: Identify, formulate, and solve broadly defined technical or scientific problems of industrial chemistry by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline

SO-2: Formulate or design a system, process, procedure or Industrial chemistry related program to meet desired needs.

SO-3: An ability to develop and conduct any chemistry related experiments, analyze by applying appropriate techniques, modern instruments and interpret data and use scientific Justification to draw conclusions.

SO-4: An ability to communicate effectively with a range of audiences

SO-5: Understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts

SO-6: Function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

SO-7: Ability to demonstrate the capacity to undertake lifelong learning.

4. Applied Geology Program

4.1. Program Education Objectives (PEO)

PEO-1: To produce technically qualified Geologist with the potential to become leaders in earth science with emphasis on natural resources (Geothermal gas, oil, Natural gas, coal, mineral resources, water and industrial minerals and rocks).

PEO-2: To produce graduate who can play an important role in identifying problems and finding solutions to geological and natural hazard (earthquakes, floods, landslides)

PEO-3: To produce Earth scientist who are committed and define ways of sustainable exploitation of geological resources for the betterment of society and nation.

4.2. Student Outcomes

SO-1: An ability to identify, formulate, and solve broadly defined technical or scientific problems of applied geology by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline

SO-2: An ability to formulate or design a system, process, procedure or program to meet desired needs related to applied geology.

SO-3: An ability to develop and conduct geological experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.

SO-4: An ability to communicate geological knowledge effectively with a range of audiences.

SO-5: An ability to understand ethical and professional responsibilities and the impact of technical and/or geo-scientific solutions in global, economic development, geo-hazard, environmental, and societal contexts.

SO-6: An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, have professional ethics, analyze risk and uncertainty.

SO-7: An ability to integrate to be part of organizations, work in consultancy firms and the capacity to undertake lifelong learning.

5. Applied Mathematics Program

5.1. Program Educational Objectives (PEOs)

PEO-1: Transfer mathematical knowledge and technology to industries and the community

PEO-2: Use knowledge and skills necessary for immediate employment or acceptance into a graduate program

PEO-3: Assist and participate in conducting research where the knowledge of Mathematics and Statistics can be applied, for instance in financial, insurance, business, agriculture, health and engineering sectors

PEO-4: Advance a core of mathematical and technical knowledge that is adaptable to changing technology and provide a solid foundation for future learning

PEO-5: Reason logically, thinks critically and act in an ethical manner in his/her or in groups of professional career in particular and the community in general.

5.2. Student Outcomes

SO-1: An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.

SO-2: An ability to formulate or design a system, process, procedure or program to meet desired needs.

SO-3: An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.

SO-4: An ability to communicate effectively with a range of audiences.

SO-5: An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.

SO-6: An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

6. Program of Applied Physics

6.1. Program Educational Objectives (PEOs)

PEO-1: To produce qualified researcher that can conduct scientific research in the area of physics that solve the problem of the society

PEO-2: To produce qualified Physicist who continuously upgrade his professional career and can apply his knowledge in Physics-related careers in industry, higher institutions and social affairs

PEO-3: To produce professionals who can give demand driven community service by applying the knowledge of physics

PEO-4: To produce an expert who can work in group, make reliable decisions, have personal confidence, have sense of responsibility and have the commitment to serve the community

6.2. Student Outcomes

SO-1: An ability to identify, formulate, and solve broadly defined technical or scientific problems of physics by applying knowledge of mathematics and science and/or technical topics to areas relevant to discipline.

SO-2: An ability to formulate or design physical system, process, procedure or program to meet desired needs

SO-3: An ability to develop and conduct physics related experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions

SO-4: An ability to ethically communicate effectively with scientific community and others.

SO-5: An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts

SO-6: An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

SO-7: Acquire the computational and information technology skills, to collect, order, analyze and present data using computers and other electronic systems.

7. Pharmacy Program

7.1. Program Education Objectives

PEO-1: To produce qualified pharmacists with operational and leading role in health sector and pharmaceutical industries.

PEO-2: To create skilled and qualified pharmacist who can conduct demand-driven, collaborative, and team-based research to solve socioeconomic issues

PEO-3: To deliver pharmacy services that is community-focused and upholds the highest standards of morality, intellect, and social principles.

PEO-4: To produce pharmacy graduates with the necessary knowledge and skills to adapt, develop, and transfer technologies to industries, as well as to become entrepreneurs in the pharmaceutical and medical fields.

7.2. Student Outcomes (SOs)

SO-1: Discuss the fundamental concept and knowledge in discipline of pharmacy including biomedical and pharmaceutical sciences

SO-2: Exhibit knowledge from his/her major domain in problem identification, critical thinking, analysis and providing solutions to pharmaceutical and allied technology disciplines.

SO-3: Analyze and formulate solutions to pharmaceutical related problems

SO-4: Apply practical, digital and numeracy skills in clinical, industrial and community pharmacy settings.

SO-5: Display integrity, ethics and professionalism in general conduct

SO-6: Display abilities to manage tasks in drug manufacturing and clinical settings as a member and leader in a diverse team.

SO-7: Demonstrate entrepreneurship skills and transfer technologies to industries pertaining to pharmaceutical related areas.

8. Civil Engineering Program

8.1. Program Educational Objectives

PEO-1: To produce technically qualified professional Civil Engineers with the potential to undertake detailed planning, design, construction, management, maintenance and rehabilitation of Civil Engineering Works.

PEO-2: To produce Civil Engineers who can pursue advanced study and research in engineering, and engage in diverse alternative national and international productive career choices.

PEO-3: To produce professionals skilled in critical reasoning and vital quality skills to identify, formulate and resolve Civil Engineering problems by considering environmental and social sensitivities.

PEO-4: To create professionals who have the ability to design, develop and evaluate new innovative technology and apply them for the need of industry and community.

8.2. Student Outcomes (SOs)

SO-1: An ability to identify, formulate, and solve complex civil engineering problems by applying principles of engineering, science, and mathematics including using modern tools.

SO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO-3: An ability to communicate (written and/or orally) effectively with a range of audiences.

SO-4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO-6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

SO-7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

9. Water Resources Engineering Program

9.1. Program Educational Objectives (PEOs)

PEO-1: To produce qualified Water Resource Engineers with the potential to execute detailed pre-feasibility study, planning, design, supervision and construction of water resources projects with high potential of being Leaders.

PEO-2: To train Water resources professionals who can identify water resources development problems, develop solutions, maintain and rehabilitate existing water Resources infrastructures.

PEO-3: To produce Water Resources professionals who can involve in water resources research and consultancy service.

PEO-4: To produce Water Resources Engineers who are socially responsible, respect professional ethics, value and engaged in team work, apply innovative knowledge, generate and transfer technology useful for water sectors.

9.2. Student Outcomes

SO – 1: An ability to identify, formulate, and solve complex Water resources engineering problems by applying principles of engineering, science, and mathematics.

SO – 2: An ability to apply water resources engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO – 3: An ability to communicate effectively with a range of audiences.

SO – 4: An ability to recognize ethical and professional responsibilities in water resources engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO – 5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO – 6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use water resources engineering judgment to draw conclusions.

SO – 7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
SO – 8: An ability to engage in a research and lifelong learning in the broadest context of technological change.

10. Computer Science and Engineering (CSE) Program

10.1. Program Education Outcomes (PEO)

PEO-1: Be employed as computer science or computer engineering professionals demonstrating optimal professional competency or be able to pursue further graduate educational opportunities.
PEO-2: Demonstrate peer-recognized expertise together with the ability to articulate that expertise as computer science or computer engineering professionals
PEO-3: Acquire strong analytic, design, and implementation skills required to formulate and solve computer science or computer engineering problems in the IT industry or research environment to create innovative technological solutions.
PEO-4: Demonstrate that they can operate, communicate, collaborate, work in a team and adjust themselves for a lifelong learning and multidisciplinary research approach as ethically and socially responsible computer science or computer engineering professionals.

10.2. Students Outcomes

SO-1: Ability to identify, formulate, analyze, and solve complex computing or engineering problems by applying principles of computing, engineering, science, and mathematics.
SO-2: Ability to design, implement, and evaluate a computing or engineering solution to meet a given set of requirements, with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
SO-3: Ability to apply computer science theory and software development fundamentals to produce computing-based solutions.

SO-4: Ability to develop and conduct appropriate experimentation analyze and interpret data, and use engineering judgment to draw conclusions.
SO-5: Ability to communicate effectively with the computing and engineering community about complex computing and engineering activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.
SO-6: Ability to recognize ethical and professional responsibilities and make informed judgments in engineering and computing practice based on legal and ethical principles, considering the impact of solutions in global, economic, environmental, and societal contexts.
SO-7: Ability to function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline, creating a collaborative and inclusive environment, establishing goals, planning tasks, and meeting objectives.
SO-8: Ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

11. Electronics and Communication Engineering (ECE) Program

11.1. Program Education Outcomes (PEOs)

PEO-1: To provide graduates with a strong foundation in mathematics, science and engineering fundamentals to enable them to devise and deliver efficient solutions to challenging problems in Electronics &Communications Engineering.
PEO-2: To produce ethically competent and technically qualified Electronics and Communication Engineers with the potential to become leaders in Industries and Companies associated with Electronics and Communication Engineering, and able to pursue research or have successful career in Academia.
PEO-3: To produce Electronics and Communication Engineers who are committed to sustainable development of Electronics and Communication Systems Companies and Industries for the betterment of society and nation.

PEO-4: To prepare graduates that can critically analyze existing literature in an area of specialization and ethically develop innovative and research-oriented methodologies to solve the problems identified to support the socio-economic development of the nation.

11.2. Student Outcomes

SO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
SO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
SO-3: An ability to communicate effectively with a range of audiences.
SO-4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
SO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
SO-6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
SO-7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

12. Electrical Power and Control Engineering (EPCE) Program

12.1. Program Education Outcomes (PEOs)

PEO-1: To provide graduates with a solid foundation in mathematical, scientific, and engineering fundamentals and depth and breadth studies in Electrical Power and Control Engineering, to comprehend, analyze, design, provide solutions for practical issues in Electrical Power and Control Engineering

PEO-2: To provide technical knowledge and skills to identify, comprehend, and solve complex tasks in industry and inspire the students to become future researchers/scientists with innovative ideas.

PEO-3: To develop team-spirit and enterprising skills with effective communication and technical abilities to serve the society locally and internationally.

PEO-4: To produce innovative engineers who can hold leadership responsibilities, establish their own enterprises and perform technology transfer for industries.

12.2. Student Outcomes

SO1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

SO2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO3: An ability to communicate effectively with a range of audiences.

SO4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

SO7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

13. Software Engineering Program

13.1. Program Education Outcomes (PEOs)

PEO-1: Graduates will obtain general scientific and engineering knowledge, practical skills and general competences that make them confident to develop high-quality software solution in various application domain to meet the needs of industry and academia;

PEO-2: Graduates will communicate effectively as SE professionals with users, peers and upper management ethically and proactively;

PEO-3: Graduates will demonstrate an understanding of the importance of life-long learning, professional development and pursue postgraduate studies and succeed in academic and research careers;

PEO-4: Graduates will develop progressively managerial, reading, and influential roles in their work area and in the communities while solving community problems.

13.2. Student Outcomes

SO1: Ability to identify, formulate, analyze, and solve complex computing or engineering problems by applying principles of computing, engineering, science, and mathematics.

SO2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO3: An ability to communicate effectively with a range of audiences.

SO4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

SO7: Cultivate the field of computing and its latest trends, to pursue teaching, research and development activities using appropriate learning strategies

SO8: An ability to use the techniques, skills, and modern engineering tools and processes necessary for software engineering practice to maintain legacy software systems and to develop new software systems

SO9: An ability to apply software engineering perspective through software design and construction, requirements analysis, verification, and validation, to develop solutions to modern problems such as security, data science, and systems engineering that meets the automation needs of the society and industry.

14. Chemical Engineering Program

14.1. Program Education Objectives

PEO-1: To produce Chemical Engineers who can understand practical chemical process industries and related areas besides applying innovative knowledge.

PEO-2: To produce Chemical Engineers who are skillful to identify, troubleshoot and fix technical problems in chemical process industries and related areas by applying appropriate solutions.

PEO-3: To produce Chemical Engineers who can conduct researches by applying basic scientific principles and chemical engineering knowledge to enhance professional engagement and advancing learning.

PEO-4: To produce Chemical Engineers who are ethical and committed to coordinate and team up individual's task for better achievement and play a leadership role in the organization.

PEO-5: To produce Chemical Engineers who are entrepreneurs and devoted to serve the community through research project, consulting and ensuring sustainable development.

14.2. Student Outcomes (SOs)

SO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

SO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO-3: An ability to communicate effectively with a range of audiences.

SO-4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO-6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

SO-7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

15. Materials Science and Engineering Program

15.1. Program Education Objectives (PEOs)

PEO-1: To produce technically qualified Materials Engineers with the potential to become leaders in ceramic, metal, polymer and semiconductor industries that Fabricate/Synthesize/Process materials ranging from macro to nanoscale level for different applications.

PEO-2: To produce an Engineer in Materials Science and Engineering who are committed to sustainable development of industries that design new materials and devices for the betterment of society and nation

PEO-3: To produce ethical and competent Engineers in Materials Science and Engineering who are capable to Conduct economic and technically feasible community research projects in the areas related to Metals, Ceramics, polymers, Composites, Semiconductors, or other processing industries.

PEO-4: To produce Engineers in Materials Science and Engineering who can work to advance the quality of communities' life using science and technology.

PEO-5: To produce an Engineer in Materials Science and Engineering who are capable to advice a government in materials related issue and policy preparation

PEO-6: To produce an Engineer in Materials Science and Engineering who are capable of communication using Mathematics, Science and engineering fundamentals through written, verbal, listening, and reading.

15.2. Student Outcomes

SO-1: An ability to identify, formulates, and solves complex engineering problems by applying principles of engineering, science, and mathematics.

SO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO-3: An ability to communicate effectively with a range of audiences.

SO-4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO-6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

SO-7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

16. Mechanical Engineering Program

16.1. Program Education Objectives

PEO-1: To produce a qualified mechanical engineer who engage in problem solving, design, manufacture, maintenance, and management of mechanical systems by systematically applying appropriate mathematical theories, computational tools, applied sciences and technology, and who pursue further education in mechanical engineering or any relevant field of study applicable in cement, sugar, lather, power generation, vehicle, and farm machinery industries and etc.

PEO-2: Manifest expected level of ethics and responsibility with a very good awareness of social, economic and environment issues with in local as well as global context.

PEO-3: Communicate effectively with professionals and non-professionals, be very good team player in interdisciplinary and multidisciplinary projects.

PEO-4: Motivated and dedicated for lifelong learning and be at the forefront to strive and apply new technologies and contemporary knowledge through.

16.2. Student Outcomes (SOs)

SO-1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

SO-2: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO-3: An ability to communicate effectively with a range of audiences.

SO-4: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

SO-5: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO-6: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

SO-7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

ASTU Centers of Excellences (CoEs)

01 Space Technology Institute

02 Institute of Pharmaceutical Science

03 Urban Housing and Development

04 Transportation and Vehicle Engineering

05 Water Resource & Irrigation Engineering

06 Advanced Manufacturing Engineering

07 Advanced Materials Science and Engineering

08 Electrical Systems and Electronics

PEOs and SOs of ASTU's Programs

June, 2024

Adama, Ethiopia